REDACTED – FOR PUBLIC INSPECTION

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Special Access for Price Cap Local Exchange Carriers	)	WC Docket No. 05-25
	)	
	)	
AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services	)	RM-10593

DECLARATION OF WILLIAM P. ZARAKAS AND SUSAN M. GATELY

January 27, 2016

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DECLARATION OF WILLIAM P. ZARAKAS AND SUSAN M. GATELY

I. QUALIFICATIONS

1. **William P. Zarakas.** My name is William P. Zarakas. I am a Principal with The Brattle Group, an economics consulting firm, where I work primarily on economic and regulatory matters concerning the communications and energy industries. I have been involved in the economic analysis of issues facing these industries for roughly 30 years. I have provided reports and/or testimony before the Federal Communications Commission (FCC), the Federal Energy Regulatory Commission (FERC), the Securities and Exchange Commission (SEC), the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments and courts of law. I have previously provided testimony to the FCC on a range of issues and proceedings, including market share and churn analyses, cost models, foreclosure and bargaining models, and pole attachments matters. My CV is attached as Appendix A.

2. **Susan M. Gately.** My name is Susan M. Gately. I am President of SMGately Consulting, LLC (SMGC), 84 Littles Avenue, Pembroke, MA 02359. SMGC is a consulting firm specializing in telecommunications, economics, and public policy. I have

participated in numerous proceedings before the FCC dating back to 1981 and have appeared as an expert witness in state proceedings before state public utility commissions. My CV is attached as Appendix B.

II. ASSIGNMENT

3. We have been asked by counsel to Sprint Corporation to review and analyze the special access data that were collected by the FCC under its *Data Collection Order on Reconsideration*[1] and provided in a series of files included in the NORC data enclave. In this Declaration, we calculate incumbent local exchange carrier ("ILEC") and competitive local exchange carrier ("CLEC") shares of various special access markets and explain how we used the enclave data in our calculations.

III. INTRODUCTION

4. This Declaration contains the results of market share and market concentration analyses designed to be both illustrative of the competitive conditions extant in the market for special access service and to serve as components of a traditional market power analysis. Taken together, the results demonstrate a market where competitive alternatives are unavailable to purchasers of special access services at the vast preponderance of locations (both buildings and cell towers) or elsewhere in the census blocks in which buildings or cell towers with special access demand are located. Moreover, the data reveal that all of the ILECs continue to be the primary sellers of services within their respective footprints.

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[1] *Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, Order on Reconsideration, 29 FCC Rcd. 11,657 (2014) ("*Data Collection Order on Reconsideration*").

5. In this Declaration, we discuss details on the development of the datasets used for the market share and market concentration analyses, the rationale behind any adjustments made to the raw data filed by the respondents to the data request, and the results of the analysis. We provide tables (referenced throughout this Declaration) detailing the results of the analyses in Appendix C.

6. We considered the guidance provided in the Besen/Mitchell Declaration concerning the specification of relevant product and geographic markets for special access in developing the datasets used in our analysis. Our review and analysis of the data provided by the FCC in the NORC data enclave indicated that it is possible to compile meaningful datasets on special access services segmented by bandwidth and census block, but it is currently not feasible to further segment the special access data by billing code attributes such as channel termination and channel mileage.

IV. DEVELOPMENT OF DATASET

7. The analysis in this Declaration has been conducted on data filed by providers of special access services—the CLEC [2] provider responses to Questions II.A.1 through II.A.19 and ILEC provider responses to Questions II.B.1 through II.B.13 included in the FCC's *Data Collection Order*. More specifically, the analysis was premised on:

   a. Data on locations served reported in files II.A.3, II.A.4, II.B.2, and II.B.3 (hereinafter the "Location Files"), and

   b. Data on prices reported in files II.A.12 and II.B.4 (hereinafter the "Pricing Files").

[2] We purposely use the term CLEC throughout this Declaration rather than the broader "competitive provider" term defined in the *Data Collection Order*. By design, our analysis attempts to focus upon the services offered by access service providers and access services.

8. Market share analyses were conducted at the most granular level possible, constrained only by limitations in the primary data. As indicated above, we broke special access services into distinct product categories for purposes of this analysis. With respect to geographic markets, our analyses were conducted at the location level, census block level, ILEC footprint level, and national level.

9. Our objective was to apply the most comprehensive datasets possible in answering questions concerning market shares. Accordingly, we used three datasets in our analyses, each covering the largest number of observations possible for that analysis. Dataset 1 is comprised of total revenues for facilities-based services (as described below) for both ILECs and CLECs. Dataset 2 is comprised of counts of competitors by locations where they provided facilities-based services, both at the census block and location level using data derived from the ILEC and CLEC Location Files. Dataset 3 is comprised of geocoded circuit counts and bandwidth for circuits provisioned using the carriers own facilities.

10. We used the raw data files in the NORC data enclave, responses to the II.A and II.B series of questions, and various FCC-provided crosswalk files and other analyses made available to parties in this proceeding in developing our datasets. We provide a more detailed discussion of the derivation of the three datasets used in our analyses below, and summarize dataset composition and derivation in **Table 1**.

11. Dataset 1 is used primarily as the basis for calculating revenue-based market shares for carriers providing special access services over their own facilities (the results of which are provided in Table 3 and discussed later in this Declaration). As is shown in Table 1, we made minor adjustments to the raw Pricing Files data, which we discuss in work steps

(a) through (d) below. The circuit count and associated revenues reported by the respondents, which served as the starting point for our analysis, are shown on the line entitled "Raw Pricing File" Data in Table 1. The specific adjustments made to these data are also shown in the table, and the resulting Dataset 1 is displayed in the line entitled "Dataset 1 – Adjusted Revenue Data." The steps involved in deriving Dataset 1 follow:

a. We deducted circuit counts and associated revenues for special access services that were not provided over the reporting carrier's own facilities. Specifically, we used the fields included in the Location Files (Table II.A.4) for Unbundled Network Elements (UNEs) and Unbundled Common Loops (UCLs) to "tag" circuits that were leased, and then excluded services provided over such leased facilities from Dataset 1.[3]

b. We assigned all of the ILEC circuits to their own footprints. We used location data to assign facilities-based CLEC special access circuits to an ILEC footprint, by using the FCC-provided "IIA_WireCenter_xWalk" in conjunction with Table II.A.8. ILEC circuits that do not have accompanying location IDs were assumed to be located in their own footprints. On the other hand, CLEC circuits that could not be mapped to an ILEC footprint due to missing location IDs or other reasons (but were facilities-based special access circuits) were assigned to a "Missing Footprint" category and included in Dataset 1.

c. We re-assigned certain circuits identified as CLEC circuits to the ILEC category. Specifically, we re-categorized circuits provided by CLEC affiliates of ILECs that

[3] As illustrated in Table 1, locations identified as "leased" were then excluded from all three datasets used to develop market shares and market concentration metrics for facilities-based services, facilities-based bandwidth sold, and billed revenues for facilities-based services.

were located in the footprint of their ILEC owner as ILEC circuits. As in the previous step, we completed this work step using the FCC-provided "IIA_WireCenter_xWalk" in conjunction with Table II.A.8. We retained the CLEC classification for circuits that were provided by the CLEC affiliate of an ILEC that were located outside of that ILEC's footprint.

d. The final step in completing Dataset 1 involved aggregating revenues across billing codes and months for each of the ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** facilities-based circuits over which special access services were provided to an active customer. The ILEC, CLEC, and total revenues shown in Table 1 are the sum of reported monthly circuit-level revenues (for all billing codes).

12. Dataset 2 comprises location observations corresponding to facilities-based circuits in terms of location coordinates (longitude/latitude), unique buildings or cell towers, and census blocks, and was derived from the ILEC and CLEC Location Files. This dataset was used primarily to analyze the presence and number of providers of special access by census blocks and locations (the results of which are provided in Tables 4 and 5 and discussed later in this Declaration). Accordingly, assignment of circuit locations to ILEC footprints and census blocks was important in completing this analysis. We used the raw Location File data as a starting point for this dataset, and adjusted these data downward for those circuits that are reported as being leased and those with location data insufficient to be mapped to a census block. The specific adjustments made to these data are also shown in Table 1, and the resulting Dataset 2 is displayed in the line entitled

"Dataset 2 – Adjusted Location Files." The steps involved in deriving Dataset 1 are shown in (e) and (f) below.

e. As shown in Table 1, the number of locations in the raw Location Files was ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****. We mapped each location to a geocode using the combination of location information included in the Location Files, the FCC's geocoding cross-walk files (CLECLocations_Geocoded.txt and ILECLocations_Geocoded.txt), and ArcGIS software. ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of locations could not be assigned geocodes.[4] The total number of locations included in Dataset 2 is ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** locations, located in ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** unique census blocks.[5]

f. We undertook a further step in the geocoding process to identify unique location addresses. We assigned each geocoded location to a building or cell tower. Location coordinates (longitude and latitude) that were (a) within the same census

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[4] The adjustments to the raw Location Files shown in Table 1 also include the exclusion of ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** at which special access was not facilities-based.

[5] It is worth noting that our independently developed census block and building/tower counts are quite similar to those developed by the FCC and released as "Building XWalks" with the January 15, 2016 update to the NORC data enclave.

block and (b) within 10 meters of each other,[6] were assigned geocoded locations to the same building or cell tower. Thus, the number of total locations in Dataset 2—***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****—is greater than the calculated number of unique buildings or cell towers shown in Table 1: ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****.[7]

13. Dataset 3 is comprised of circuit counts based on the presence of facilities and bandwidth at the census block level, and is also derived from the ILEC and CLEC Pricing Files and Location Files. Dataset 3 was used to calculate bandwidth-based market shares for special access. Such calculation requires that all circuit observations include associated bandwidth and location data sufficient to map it to a census block. The specific adjustments made to these data are also shown in Table 1 and the resulting Dataset 3 is displayed in the line entitled "Dataset 3 – Geocoded Pricing Data." The steps involved in deriving Dataset 3 are shown in steps (g) through (j) below.

    g. We merged Pricing Files and Location Files for purposes of mapping individual circuits to census blocks. The derivation of Dataset 3 started with the line

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[6] Locations that were sequentially within 10 meters of each other were also determined to be in the same building or at the same tower. For example, suppose locations A, B, and C are all in the same census block, that A is 7 meters from B and C is 5 meters from B and 12 meters from A. In this instance, all three locations would be coded to be in the same building. This may slightly overstate what locations are in the same building and, as a result, overstate the percentage of total buildings/towers with a competitive presence. The FCC performed a similar analysis that resulted in the creation of the "Building XWalks" described in the footnote above using a larger 50-meter screen.

[7] The differential between the raw location count and the number of unique building/tower locations referenced here is driven by the occurrence of duplicate location entries in the Location Files of some carriers and the fact that a subset of the locations is served by more than one facilities-based provider.

"Dataset 1 – Adjusted Revenue Data," which excluded circuits that were leased and re-assigned certain circuits reported by CLEC affiliates of ILECs.

h. We excluded circuits that could not be mapped to census blocks, either due to missing location IDs or other reasons.[8]

i. We also excluded a very small number of circuits for which circuit bandwidth was unspecified in the Pricing Files (*i.e.*, in cases for which the bandwidth designation was "0" or "0.01").

j. We adopted a general assumption concerning bandwidth for circuits that were designated to be greater than 1 Gbps but for which specific bandwidth was not provided (*i.e.*, in cases for which the bandwidth designation was "-99999").

14. Table 1 indicates that the resulting Dataset 3 comprises ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** circuits and ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks, as shown in Table 1.

V. MARKET SHARE AND MARKET CONCENTRATION ANALYSES AND RESULTS

15. As shown in Table 1, the combined raw ILEC and CLEC Pricing Files yielded revenues equal to ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY**

[8] ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of the total circuits included in the raw dataset did not contain a valid location ID. As a result, we excluded ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** ILEC circuits and ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** CLEC circuits from Dataset 3.

CONFIDENTIAL *** realized on sales associated with ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** special access circuits.[9] Table 1 also summarizes the adjustments made to the raw Pricing Files—*i.e.*, exclusions for leased circuits and re-classification of certain CLEC circuits (as described above). This resulted in Dataset 1 comprising revenues equal to ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** realized on sales associated with ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** special access circuits. Of these, ILEC billings account for ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of all billing for facilities-based special access services.

16. **Table 2** displays the count of circuits by bandwidth category regardless of technology. In Table 2, we segmented all special access services, regardless of technology, into five categories by bandwidth (or "speed buckets"): (1) less than or equal to 10 Mbps; (2) greater than 10 Mbps and less than or equal to 50 Mbps; (3) greater than 50 Mbps and less than or equal to 200 Mbps; (4) greater than 200 Mbps and less than or equal to 800 Mbps; and (5) greater than 800 Mbps. These bandwidth categories differ from the

[9] Each circuit observation is a unique combination of the reported filer, location, customer, circuit ID, circuit type, and bandwidth. The Pricing Files provided separate observations for the combination of circuits and billings codes on a monthly basis. For example, the circuit observations for a customer that received channel termination and mileage (two separate billing codes) for, say, a single DS1 circuit for each month in the year would equal 24 (*i.e.*, 2 billing codes x 12 months). We collapsed monthly data and billing codes for a single circuit into a single observation in developing the number of circuits and associated revenue data that we used in calculating ILEC and CLEC revenue-based market shares.

Service Type fields included in Table II.B.8 and II.B.9 in two primary regards.[10] First, we selected bands that spanned the full range of bandwidth potential between DS1 level circuits and 1 Gbps circuits. Second, we selected a band of greater than 800 Mbps (instead of two bands, one equal to a broad range of 100 Mbps to 1,000 Mbps and another set to greater than 1,000 Mbps) in order to capture the market for high speed circuits, Ethernet or otherwise. We viewed these bandwidth categories as complementary to the bandwidth categories in Tables II.B.8 and II.B.9. The bandwidth (speed) field in each circuit record in the Pricing Files[11] allowed the reported circuits to be segmented by bandwidth category regardless of technology.

17. Table 2 indicates that the ILECs were the sellers of special access services for ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** circuits out of the ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** special access circuits included in Dataset 1. Table 2 also indicates that the ILECs' special access circuits with speeds of 10 Mbps or less accounted for ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of all special access circuits in this bandwidth bucket. The table also indicates that circuits with speeds of 10 Mbps or less accounted for ***** BEGIN HIGHLY**

[10] The record format in Table II.B.8 (CBDS Revenues) for the Service_Type field was: DS1; DS3; and Other CBDS. The record format for Table II.B.9 (PBDS Revenues) for the Service_Type field was: A for bandwidth less than or equal to 1.5 Mbps; B for bandwidth greater than 1.5 Mbps but less than or equal to 50 Mbps; C for bandwidth greater than 50 Mbps but less than or equal to 100 Mbps; D for bandwidth greater than 100 Mbps but less than or equal to 1 Gbps; and E for bandwidth greater than 1 Gbps.

[11] The ILEC and CLEC Pricing Files included the following fields: DSN_BANDWIDTH, OTHERCBDS_BANDWIDTH, and PBDS_BANDWIDTH.

CONFIDENTIAL * [redacted] *** END HIGHLY CONFIDENTIAL ***** of all special access circuits. All circuits up to 50 Mbps (*i.e.*, circuits with speeds of 10 Mbps or less and circuits greater than 10 Mbps and less than or equal to 50 Mbps) accounted for over ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of all special access circuits, with ILEC circuits accounting for over ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of those circuits.

18. The bandwidth field in each circuit record in the Pricing Files also allowed the revenue-based market shares to be segmented by bandwidth category regardless of technology, which we show in **Table 3**. The analysis summarized in the table indicates that ILEC revenue-based market shares were highest for ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****. The table also indicates that the ILECs also had ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****. Circuits greater than 200 Mbps (*i.e.*, circuits with speeds greater than or equal to 200 Mbps and less than or equal to 800 Mbps, and greater than 800 Mbps) account for ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of all special access circuits.

19. We developed locational analyses using Dataset 2, which we used to develop the distribution of special access providers by census block. This analysis indicated that facilities-based special access services were provided in ***** BEGIN HIGHLY**

CONFIDENTIAL * [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks. Of these, the ILECs reported that they provided special access in ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks, and CLECs reported providing facilities-based special access services in ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks. The results of this analysis are summarized in **Table 4**.

20. Table 4 also indicates that an ILEC was the sole provider of special access services in ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks included in the dataset. Alternatively, the ILECs were the sole providers of special access services in ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks where they have indicated that they are currently selling special access service.

21. In addition, Table 4 shows that ILECs and CLECs both have reported selling special access service over their own facilities in ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL ***** census blocks. As is shown in Panel 4B, in the vast majority of these cases, special access presence was limited to an ILEC and a single CLEC ***** BEGIN HIGHLY CONFIDENTIAL *** [redacted] *** END HIGHLY CONFIDENTIAL *****.

22. The location data included in Dataset 2 were also used to derive the number of providers reporting special access by building or cell tower location. **Table 5** indicates that an

ILEC was the sole provider in ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** identified building or cell tower locations. It also shows that no more than two providers have a special access presence in ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of the remaining building or cell tower locations.

23. We calculated bandwidth shares, in addition to the revenue-based shares (using Dataset 1) and the locational analysis (using Dataset 2). We used Dataset 3 to calculate bandwidth-based market shares, with bandwidth share defined as the sum of bandwidth provided by each special access carrier within a census block divided by the total special access bandwidth sold within the census block.[12] Bandwidth shares are calculated to be 100 percent in census blocks where only one carrier (either an ILEC or a CLEC) report special access sales over their own facilities. In census blocks where facilities-based special access was sold by more than one carrier, bandwidth shares for each carrier are less than 100 percent.

24. **Table 6** shows: (i) the number of census blocks where an ILEC was the sole provider of special access, and had a 100 percent bandwidth, and (ii) the number of census blocks where a CLEC was the sole provider of special access using their own facilities, and had a 100 percent bandwidth share.

[12] For example, if in a defined geographic market (*i.e.*, a census block), an ILEC provides 300 Mbps of special access services, CLEC A provides 100 Mbps of service, and CLEC B provides 200 Mbps of service, then the sum of bandwidth in the geographic market equals 600 Mbps and the ILEC's share of the market is equal to 50 percent, while CLEC A's share is equal to 16.7 percent and CLEC B's share is equal to 33.3 percent.

25. As indicated earlier when we described the development of Dataset 3, all observations in the dataset must have accompanying circuit bandwidths and location data in order to calculate bandwidth shares for each carrier by census block. Accordingly, Dataset 3 includes—and the bandwidth shares are based on—fewer circuit observations than Dataset 1 and fewer census block observations than Dataset 2.[13]

26. Table 6 demonstrates the bandwidth share analysis for all ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks included in Dataset 3. The table indicates that an ILEC had 100 percent bandwidth share (*i.e.*, it was the sole provider of facilities-based special access services) in ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of the census blocks in the dataset. Alternatively, an ILEC had a 100 percent bandwidth share in ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of the census blocks in which it had an active special access customer.

27. We also used the bandwidth shares to calculate Herfindahl-Hirschman Indexes (HHIs) for each census block. The HHI for the vast majority of census blocks where special access was sold (over a carrier's own facilities) was ***** BEGIN HIGHLY**

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[13] Dataset 1 includes ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** facilities-based circuits, while Dataset 3 includes ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** such circuits. Dataset 2 includes ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks in which carriers sell facilities-based special access, while Dataset 3 includes ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** such census blocks.

CONFIDENTIAL * [redacted] ***** END HIGHLY CONFIDENTIAL *****. In **Table 7**, we demonstrated the distribution of HHIs across: (a) census blocks where ILECs provided special access (Panel 7A), and (b) across all census blocks where carriers reported selling special access over their own facilities (Panel 7B). The panels in Table 7 indicate that ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of census blocks have HHIs that are 5,000 or less either when looking at only census blocks where ILECs sell special access services or at all census blocks where carriers reported selling facilities-based special access. ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of census blocks where carriers (ILECs and CLECs) reported selling special access have HHIs of 10,000, as do ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** of census blocks where ILECs provided special access.

28. Finally, we used the CLEC location data in Dataset 2 (which was the basis for the breakdown of facilities-based special access services in Table 4)[14] to compare: (i) the census blocks in which CLECs deployed fiber facilities, with (ii) the extent to which CLECs reported providing special access over their own facilities. As shown in **Table 8**, CLECs reported having fiber facilities ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****.[15] However, CLECs provided facilities-based special access in a very small subset of these census

[14] Specifically, Table II.A.4 as adjusted as described earlier in this Declaration.

[15] Census blocks in which CLECs have a fiber presence were derived from the CensusBlocksWithFiber.txt.

blocks ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL *****. The table also indicates that three or more CLECs provided special access over their own facilities in only ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks. This is a small fraction of the ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks included in Dataset 2 and a still smaller fraction of the ***** BEGIN HIGHLY CONFIDENTIAL ***** [redacted] ***** END HIGHLY CONFIDENTIAL ***** census blocks where CLECs have reported deploying fiber facilities.

APPENDICES

APPENDIX A:
ZARAKAS CV

William P. Zarakas is a Principal with The Brattle Group, an economics consulting firm, and an expert on economic and regulatory matters involving the communications and energy industries. He has worked on a wide range of issues concerning the telecommunications and media industries, including cost and pricing analyses in regulated industries, economic feasibility analyses associated with building-out broadband infrastructure, valuation of wireless spectrum, and, analyses rates and the distribution of royalties in the cable and satellite television industries.

Mr. Zarakas also has extensive experience in analyzing the economics and regulation of utility infrastructure and the evolving factors that are affecting utility business models. Recent applications of this focus include the impacts distributed generation resources on utility business models and cost-benefit analyses relating to utility investments in smart grids and system resiliency. Mr. Zarakas also works on matters pertaining to the regulatory frameworks, notably with respect to performance based regulation, and the valuations of utility assets and businesses. He has also examined the impacts of investment levels, operational performance, operating cost levels, and rates on utility equity prices and on customer satisfaction.

Mr. Zarakas has provided testimony and expert reports before the Federal Communications Commission, the Federal Energy Regulatory Commission, the Securities and Exchange Commission, the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments and courts of law. He has led (and authored reports concerning) special investigations on behalf of corporate boards of directors and audits of management practices and operational and financial performance on behalf of regulatory commissions. He holds an M.A. in economics from New York University and a B.A., also in economics, from the State University of New York.

Communications Economics and Valuations

- Competition Modeling. Provided testimony concerning vertical foreclosure and Nash bargaining models in the Application of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Comcast to Assign or Transfer Control of Licenses, Federal Communications Commission, MB Docket No. 10-56.
- Cost Modeling: Developed model that estimated the cost of deploying mobile broadband in rural areas, on behalf of GCI. Authored expert report and presented model and conclusions to the FCC In The Matter Of Connect America Fund and Universal Service Reform – Mobility Fund.
- Royalty Distribution: Analyzed costs and value of retransmitted television programming in cable and satellite video markets and determined distribution of copyright royalty fees among content providers. Authored expert report Before The Copyright Royalty Judges, Library of

Congress, Washington D.C. In The Matter of Distribution of the 2004 and 2005 Cable Royalty Funds, Docket No. 2007-3 CRB CD 2004-20. June 1, 2009

- Spectrum Valuation: Directed, authored reports, and/or provided expert testimony in cases involving valuations of wireless spectrum valuation. Cases involved determining market comparable values and performing discounted cash flow (DCF) and econometric-based analyses. Analyses were conducted on behalf of communications carriers, regulatory and governmental agencies in the U.S. and abroad, capital management companies, financial institutions and debtors.
    - Conducted analyses and authored expert report estimating value of Mobile Satellite Service (MSS) spectrum (i.e., the 2 GHz Band from 2000-2020 MHz and 2180-2200 MHz, the Big LEO from 1610-1626.5 MHz and 2483.5-2500 MHz, and the L-band from 1525-1559 MHz and 1626.5-1660.5 MHz) in several matters, including matters involving the Terrestar bankruptcy. Analyses included impact of incorporating FCC authorized ancillary terrestrial component (ATC) into MSS mobile broadband networks.
    - Analyzed spectrum values in the 2.3 and 2.5 GHz bands for the U.S. market.
    - Analyzed value of Advanced Wireless Services (AWS; 1.7 / 2.1 GHz) band for the U.S. market.
    - Analyzed value of unpaired 2.1 GHz spectrum for the U.S. market.
    - Analyzed value of 2.3 GHz (WCS) 3.5 GHz (FWA) spectrum in Canadian market.
    - Authored report concerning market comparable analysis of U.S. PCS market.
    - Provided expert testimony concerning potential value of wireless spectrum in the 700 MHz band.
    - Analyzed value of Specialized Mobile Radio (SMR) and Private Land Mobile Radio Services (PLMRS) spectrum on behalf of utility operating companies in the U.S. market.
    - Analyzed value of narrowband PCS and IVDS spectrum portfolio.
    - Directed, led analysis and authored report concerning valuations of wireless spectrum in the Middle East-North African (MENA) region for an international wireless operator.
    - Directed, led analysis and authored report concerning impact of additional wireless operators on spectrum values for the telecommunications regulator in the Kingdom of Jordan.

- Pole Attachments: Analyzed and provided testimony concerning the determination of the rates for pole attachments under the FCC's Cable Rate and Telecom Rate Formulas as applied to electric utility distribution assets. Virginia Cable Telecommunications Association v. Virginia Electric and Power, 2001.
- International Arbitration (satellite communications): Authored expert report concerning the impact of an alleged breach of contract on lost profits in a 23 country business operation concerning a satellite communications business. Performed detailed financial modeling to determine revenues, net income and net present value using risk adjusted discount rates for a satellite service provider.
- Commercial Litigation (broadband communications): Provided expert testimony concerning the estimate of commercial damages stemming from an alleged breach of contract associated with relocating infrastructure assets. Public Service Company of New Mexico vs. Smith Bagley, Inc. and Lite Wave Communications LLC In The United States District Court For The District of New Mexico. March 2007.
- Commercial Litigation (wireline communications): Developed analysis and supported expert testimony concerning damages associated with cable breaks and disruption of wholesale transport services. Analysis involved estimating lost profits and determining replacement cost of temporarily lost capacity. MCI WorldCom Network Services, Inc. v. MasTec, Inc. before the United States District Court Southern District of Florida, Case No. 01-2059-CIV-GOLD. May 2002.
- Asset Valuations: Directed and led multiple valuation analyses of telecommunications assets and businesses. Projects included valuations of infrastructure assets in multiple markets worldwide. Projects required comprehensive discounted cash flow and net present value analyses, as well as regression and statistical analyses of comparable market transactions. Projects resulted in valuations used in support of negotiations and/or in commercial litigation.

Rate, Cost, Pricing and Regulatory Analyses

- Performance Based Ratemaking Analyses. Conducted for utilities and regulators on matters concerning incentive regulatory frameworks as well as targeted performance incentives. Recent examples of authored expert reports and testimony: Massachusetts D.P.U. 12-120 and Hawaii Docket No. 2013-1041.

- Incentive Analysis for Electric Distribution Reliability. Comprehensive analysis of approaches to setting electric distribution reliability standards on behalf of the Australian Energy Market Commission (AEMC).
- Incentive Regulation. Comprehensive analysis of incentive systems to be applied to incumbent local exchange telephone carriers (ILECs) on behalf of the New York State Department of Public Service; involved modeling determining total factor productivity (TFP) based on empirical analysis and consideration of projected performance improvement initiatives.
- Electric Distribution Resiliency Analysis. Comprehensive benefit cost analysis employing value of lost load (VOLL) methodology conducted for Public Service Electric & Gas (PSE&G) in NJ BPU Docket No. EO13020155 and GO13020156.
- Cost and Rate Analyses:
    - Conducted for electric utilities concerning deployment of upgraded transmission and distribution infrastructure and smart grid applications.
    - Conducted on behalf of telecommunications and broadband companies in the United States, Europe and Asia concerning cost-of-service and incremental pricing principles for communications services products.
    - For a municipality deploying a Wi-Fi network by using street lights and utility infrastructure; analysis included determination of cost of service.
    - Expert Witness in multiple U.S. state regulatory proceedings concerning analysis of rates for unbundled network elements (UNEs), undertaken in fulfillment of requirements associated with the Telecommunications Act of 1996, using the Total Element Long Run Incremental Cost (TELRIC) methodology.
- Financial and Pricing Analyses: Conducted comprehensive financial analysis for a broadband communications provider in the U.S. market, including: developing projections of demand, price elasticities, revenue and capital and operating costs, and pricing points.
- Transfer Pricing: Performed comprehensive studies of affiliate transactions and cost allocations between holding companies and operating subsidiaries on behalf of telecommunications carriers and electric and gas utilities. Report filed before state regulatory commissions and the Federal Communications Commission.

- Performance Analysis: Analyzed wholesale access performance measurement systems on behalf of SBC (now AT&T). Project scope included analysis of the statistical validity of performance measures agreed upon by SBC and regulators as part of approval of SBC's provision of long distance services (as part of proceedings concerning Section 271 of the Telecommunications Act of 1996) or are the outcome of negotiations among various parties regarding proposed mergers. Work focused on detailed statistical testing of performance measures to determine whether measures reflected RBOC performance and supported regulatory goals of increased consumer welfare in local exchange markets.
- Regulatory Frameworks: Directed and led multiple engagements on behalf of telecommunications carriers, utilities and regulatory commissions concerning the analysis of changes in regulatory frameworks, including: theoretical and quantitative analysis of the impact of adoption of earnings-based and price-based incentive rate plans upon retail prices and service quality; and a study of the impact of alternative regulatory frameworks on ILEC deployment of advanced telecommunications services, performed on behalf of a state regulatory commission.

Utility Strategic and Management Analysis

- Investment Analysis: Authored expert report concerning the impact investments in electric and gas utility infrastructure on system reliability and resiliency, especially following major weather events. Primary area of analysis involved estimation of economic value of investments to customers using value of lost load (VOLL) metrics for electric system investments and consumer surplus and value added metrics for gas system investment.
- Strategic Option Analysis: Directed Strategic Organizational Analysis for the Long Island Power Authority. Project involved definition and analysis of organizational options (privatization, municipalization and outsourced management services arrangements) available to LIPA going forward. Options were evaluated based on rate impacts and risk factors, including risks associated with organizational transformation. Project required extensive modeling of LIPA operations and financing scenarios, as well as analysis of power and transmission markets. Project work also involved interaction with LIPA's management team, its Board of Trustees and Board sub-committees.
- Merger Analysis: Authored expert reports concerning prospective merger savings and divestiture losses for electric and gas utilities. Scope of work included analyses involved in determining the operating and capital impacts of mergers under multiple scenarios, and also

involved the anticipated economic inefficiencies resulting from forced divestiture. Reports authored included studies of merger efficiencies and reports concerning Economic Loss Studies included in U-1 filings before the U.S. Securities and Exchange Commission. Economic Loss Studies are required under PUHCA Section 11 (b) (1) Clauses A, B, and C when utility merger results in the establishment of a registered holding company with electric and gas businesses. Work in these areas included detailed analyses of current and hypothetical future electric and gas utility operations.

- Benchmarking Analysis: Conducted transmission and distribution (T&D) function benchmarking study for a major Midwestern U.S. electric utility. Study involved comprehensive analysis of capital and operating costs and reliability and the impact that changes in expenditure would likely have upon earnings and shareholder value as well as distribution system reliability.
- Valuation: Directed and advised board of directors of a major generation and transmission (G&T) cooperative and its member electric distribution cooperatives on matters concerning: asset valuations, risk management strategy, merger and acquisition options, and outlook for retail electric markets.
- Feasibility Analyses: Conducted financial analyses and economic feasibility studies of new business opportunities for electric and gas utilities (e.g., fuel cell and distributed generation technologies and alternative fuel transportation) on behalf on numerous clients.
- Transfer Pricing: Authored reports and provided expert testimony on matters of affiliate transfer pricing, corporate overhead allocation, cost allocation, and cross-subsidization, performed on behalf of electric utilities and regulatory commissions. Also, analyzed business separation and affiliate safeguards regarding flow of information, systems access, marketing controls, employee and intellectual transfers and cost allocations for U.S. utilities.
- Rate Analysis: Conducted analyses of major utility capital investment, demand and consumption and cost-of-service performed on behalf of multiple electric and gas utilities and applied in utility rate cases before state and federal regulatory commissions
- Valuation: Performed asset valuation project on generation, transmission and distribution assets for a U.S. municipal electric utility. Determined original, trended original and replacement costs, as well as development of depreciation costs. Analyses used in developing electric rates and in proceeding on municipal special franchise taxes.

- Shareholder Value Analysis: For an east coast electric utility, analyzed impact on stock prices of new and potential markets (for core and non-core utility services), pricing strategies, underlying costs, and regulatory options.
- Margin Analysis: Conducted revenue and margin, geographic impacts and value analysis of utility energy efficiency initiatives on behalf of a major west coast electric utility.

Forensic Analysis and Special Investigations

- Forensic Analysis and Special Investigation: Directed consulting team and authored report for the forensic analysis of the economics, financial reporting and accounting associated with allegation of accounting and financial improprieties by Global Crossing. Worked on behalf of the Special Committee on Accounting Matters composed of a subset of (and reporting to) the Board of Directors of Global Crossing Ltd. Analysis involved determination of basis for revenue recognition for concurrent (i.e., "swap") transactions. Analysis included in report by the Special Committee entitled "The Concurrent Exchange of Fiber Optic Capacity and Services Between Global Crossing and its Carrier Customers." January 2003.
- Commercial Litigation: Directed expert consulting team in litigation matter concerning the deployment schedule of bandwidth on a major undersea cable project. Case involved allegations of breach of contract. Case work involved modeling of undersea fiber optic bandwidth in major undersea crossings and financial analysis of project viability.
- Forensic Analysis and Securities Litigation: Directed consulting team and led technical analysis concerning accounting and financial disclosure on behalf of the defendant in a class action against corporate officers, directors, controlling shareholders and the company's outside auditors alleging violations of the Securities Act of 1993 and the Securities Exchange Act of 1934. Scope of case involved accounting and disclosure treatment of complex leases.
- Special Investigations and Audits: Directed project teams, led technical analysis and authored reports in multiple special investigations and audits of management, operations and finance and accounting on behalf of regulatory utility commissions. Special investigations and audits involved allegations of improper cross subsidization and/or transfer pricing practices by regulated utilities (telecommunications, electric and/or natural gas) and their effect on rates charged to consumers. Special investigations and audits were conducted for regulatory commissions in Alabama, Kentucky, Maryland, New York and Pennsylvania.

Financial and Business Analyses

- Commercial Litigation: Developed expert report concerning damages associated with alleged breach of contract concerning gaming licenses in Asian casino markets. Analysis involved estimating projected cash flows under current and "but-for" scenarios.
- Economic Impact Analysis: Directed analysis and authored report regarding the effects of changes in regulatory fees and taxes on mobile prices, penetration and the macro economies of 22 countries in the Middle East and Africa. Study, conducted on behalf of a major mobile operator, involved detailed analysis of the relationships between marginal cost and prices, market structure and concentration, and empirical relationships concerning mobile penetration and GDP.
- Demand Analysis: Directed analysis and modeling of multiple projects involving the estimation and projection of segmented customer demand.
    - Analyzed U.S. subscriber market for video services.
    - Analyzed subscriber demand for communications services in the United States, Europe, Asia and the Middle East.
    - Led comprehensive analysis of current and projected market shares and competition in the consumer and business markets for network devices. Scope of work included geographic and customer segmentation; modeling included estimation of revenue and margins by segment.
- Consumer Welfare Analysis: Directed multiple analyses of impact of changes in market structure upon consumers.
    - Performed empirical analysis on panel of approximately 50 countries to demonstrate the effect of changes in levels of competition on prices, investment and other areas of consumer welfare for the global mobile telecommunication industry.
    - Directed analysis and authored white paper on empirical analysis concerning the impact of changing the price of wholesale access and levels of investment in the U.S. telecommunications market. Results reported in white paper entitled: "Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets."
- Business Case Analysis: Directed and led multiple projects concerning the financial feasibility of entering new lines of business.

- Led feasibility study concerning development of publishing business for a major communications company. Work required comprehensive financial modeling.
- Performed comprehensive financial analysis for an infrastructure support company. Scope of work included market and competitive analyses, projections of market shares, cash flow modeling and pricing analysis.
- Performed comprehensive business case analysis of entry into the broadband market (including voice, internet access and video services) on behalf of a major U.S. electric utility. Scope of work included technology assessment and detailed financial modeling. Work included customer and geographic segmentation, pricing scenarios and elasticity analysis.
- Led comprehensive financial analysis concerning the deployment of a broadband communications network for an Asian electric utility. Related work included assessing transfer pricing methodologies regarding the use of utility assets, resources and easements by the broadband affiliate.
- Directed and led analysis of business diversification for multiple electric utilities. Business opportunities analyzed included dark fiber construction and third party use of utility poles, towers and conduit. Scope of analysis included financial modeling and transfer pricing.

TESTIMONY

Declaration of William P. Zarakas Before the Federal Communications Commission in the matter of Verizon Virginia. LLC and Verizon South, Inc., Complainants, v. Virginia Electric and Power Company d/b/a Dominion Virginia Power, Docket No. 15-90, File No. EB-15-MD-006 (November 18, 2015).

Declaration of William P. Zarakas and Matthew Aharonian (May 22, 2015) in the United States Court for the District of Columbia Circuit United States Telecom Association, Petitioner, v. Federal Communications Commission and the United States of America, Respondents, Case No. 15-1063 (and consolidated cases).

Analysis of the FCC's Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (December 21, 2014) and Supplemental Declaration: Analysis of the FCC's Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (March 5, 2015) in Application of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Comcast to Assign or Transfer Control of Licenses, Federal Communications Commission, MB Docket No. 10-56.

Before the Public Utilities Commission of the State of Hawaii, In The Matter of Public Utilities Commission Instituting an Investigation to Reexamine the Existing Decoupling Mechanisms for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, Docket No. 2013-1041, On Behalf of the Hawaiian Electric Companies. Report: "Targeted Performance Incentives: Recommendations to the Hawaiian Electric Companies," Prepared For The Hawaiian Electric Companies, William P. Zarakas and Philip Q Hanser, September 15, 2014.

Before the New Mexico Public Regulatory Commission, In The Matter Of The Application of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, For Approval of TECO Energy Inc.'s Acquisition of New Mexico Gas Intermediate, Inc. and For All Other Approvals and Authorizations Required To Consummate and Implement The Acquisition, Utility Case No. 13-00231-UT, On Behalf of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, Joint Applicants. March 2014.

"Analysis of Benefits: PSE&G's Energy Strong Program," by Peter Fox-Penner and William P. Zarakas. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Energy Strong Program, NJ BPU Docket No. EO13020155 and GO13020156.

"Review and Analysis of Service Quality Plan Structure In The Massachusetts Department of Public Utilities Investigation Regarding Service Quality Guidelines For Electric Distribution Companies and Local Gas Distribution Companies." Philip Q Hanser, David E. M. Sappington and William P. Zarakas, Massachusetts D.P.U. 12-120, March 2013.

"Alaska Mobile Broadband Cost Model, Before The Federal Communications Commission In The Matter Of Connect America Fund and Universal Service Reform – Mobility Fund. WC Docket No. 10-90 and WT Docket No. 10-208A." William P. Zarakas and Giulia McHenry, February 2013

Expert Report of William P. Zarakas In The United States District Court For The Northern District of Florida MCI Communications Services, Inc., Plaintiff v. Murphree Bridge Corporation, Defendant, Case No. 5:09-cv-337, February 19, 2010.

Testimony of William P. Zarakas Before The Copyright Royalty Judges, Library of Congress, Washington D.C. In The Matter of Distribution of the 2004 and 2005 Cable Royalty Funds, Docket No. 2007-3 CRB CD 2004-20. June 1, 2009.

Declaration of William P. Zarakas In The Circuit Court of Fairfax County, Virginia In The Matter of Sharon Dougherty, Plaintiff Vs. Thomas J. Dougherty, Defendant Case No. CL 2007-008757. October 2008.

Expert report provided in Public Service Company of New Mexico vs. Smith Bagley, Inc. and Lite Wave Communications LLC In The United States District Court For The District of New Mexico. March 2007.

Expert report entitled "Comparative Market Value Analysis of Upper 700 MHz Public Safety Spectrum" in FCC WT Docket no. 96-86 (In the Matter of The Development of Operational, Technical and

Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010). June 2006.

Expert report entitled "Analysis of Potential Lost Profits Associated With The Alleged Breach of Contract Between Orbcomm and Orbcomm Asia Limited" before the American Arbitration Association. May 2006.

Direct testimony before the Federal Communications Commission in the matter of *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as amended, for Forbearance from Sections 251(c)(3) and 251(d)(1) In the Anchorage LEC Study Area*, WC Docket No. 05-281, January 9, 2006.

Expert report co-authored with Dorothy Robyn Before the U.S. House of Representatives Committee on Energy and Commerce and the U.S. Senate Committee on Commerce, Science and Transportation regarding the value of wireless spectrum in the 700 MHz band. Letters, May 18, 2005.

Direct and rebuttal testimony before the Federal Communications Commission in the matter of *Virginia Cable Telecommunications Association v. Virginia Electric and Power Company, d/b/a Dominion Virginia Power and Dominion North Carolina Power*, PA No. 01-005, December 21, 2001.

Expert report Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with RGS Energy Group, Inc. (June 20, 2001) in Exhibit J-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Rochester Gas And Electric Corporation," May 15, 2001.

Expert report Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the acquisition by Sierra Pacific Resources of Portland General Electric Company, 2000 in Exhibit H-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Sierra Pacific Resources," January 31, 2000.

Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with CMP Group, Inc. and with CTG Resources, Inc. in Exhibit J-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Energy East," October 29, 1999.

Before the Supreme Court of the State of New York, County of Niagara, Supplemental Affidavit in *Village of Bergen, et al. vs. Power Authority of the State of New York*, February 1999.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the North Carolina Utilities Commission, Docket No. P-100, SUB 133D, Filed March 9, 1998; *In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the North Carolina Utilities Commission, Docket No. P-100, SUB 133D, Filed December 15, 1997; *In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 25, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost Studies for Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Florida Public Service Commission, Docket Nos. 960757-TP/960833-TP/960846-TP/960916-TP/971140-TP, Filed November 13, 1997; *In Re: Petition of AT&T, MCI, and MFS for Arbitration with BellSouth Concerning Interconnection, Rates, Terms and Conditions of a Proposed Agreement*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 3, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost Studies for Unbundled Network Elements*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 17, 1997; *In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 10, 1997; *In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Alabama Public Service Commission, Docket No. 26029, Filed September 12, 1997; *In Re: Generic Proceeding: Consideration of TELRIC Studies*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission, Docket No. 7061-U, Filed September 8, 1997; *In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Louisiana Public Service Commission, Docket Nos. U-22022/22093, Filed September 5, 1997; *In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Alabama Public Service Commission, Docket No. 26029, Filed August 29, 1997; *In Re: Generic Proceeding: Consideration of TELRIC Studies*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Louisiana Public Service Commission, Docket Nos. U-22022/22093, Filed July 11, 1997; *In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission, Docket No. 7061-U, Filed April 30, 1997; *In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services*.

Direct and rebuttal testimony Before the Virginia State Corporation Commission on behalf of United Telephone - Southeast, Inc. and Centel Corporation, May 1994.

Direct and rebuttal testimony Before the Tennessee Public Service Commission on behalf of United Telephone - Southeast, Inc., Docket No. 93-04818, January 28, 1994.

Direct and rebuttal testimony Before the Florida Public Service Commission on behalf of Southern Bell Telephone & Telegraph Company, Docket No. 920260-TL, December 10, 1993.

Direct and rebuttal testimony Before the Tennessee Public Service Commission on behalf of South Central Bell, Docket Nos**.** 92-13527 and 93-00311, March 22 and March 29, 1993.

PAPERS AND PUBLICATIONS

"Electric Utility Services and Evolving Platforms in the Mid-Atlantic Region," by William Zarakas, presented at the Mid-Atlantic Conference of Regulatory Utilities Commissioners (MACRUC) 20th Annual Education Conference, Williamsburg, VA, June 23, 2015.

"Growth Prospects and Shifting Electric Utility Business Models: Retail, Wholesale and Telecom Markets," by William P. Zarakas, *The Electricity Journal*, Volume 28, Issue 5, June 2015.

"Do We Need a New Way to Regulate Electric Utilities?," by William P. Zarakas, presented at the Energy Bar Association 2015 Annual Meeting, Washington, DC, May 6, 2015.

"Investing In Electric Reliability and Resiliency," by William P. Zarakas, presented at the NARUC 2014 Summer Meeting - Joint Electricity and Critical Infrastructure Committees, Dallas, TX, July 15, 2014.

"Utility Investments in Resiliency: Balancing Benefits with Cost in an Uncertain Environment," by William P. Zarakas, Sanem Sergici, Heidi Bishop, Jake Zahniser-Word and Peter S. Fox-Penner, *The Electricity Journal,* Volume 27, Issue 5, June 2014.

"Infrastructure and Competition in the Electric Delivery System," by William P. Zarakas, *The Electricity Journal*, Volume 26, Issue 7, September 2013.

"Low Voltage Resiliency Insurance, Portable small-scale generators could keep vital services on line during a major power outages," by William Zarakas, Frank Graves, and Sanem Sergici, forthcoming *Public Utilities Fortnightly* September 2013.

"Finding the Balance Between Reliability and Cost: How Much Risk Should Consumers Bear?," by William P. Zarakas and Johannes P. Pfeifenberger, presented at the Western Conference of Public Service Commissioners, Santa Fe, NM, June 3, 2013

"The Utility of the Future: Distributed or Not?," by William P. Zarakas, presented at Advanced Energy 2013, New York, NY, April 30, 2013

"Rates, Reliability, and Region," by William P. Zarakas, Philip Q Hanser, and Kent Diep, *Public Utilities Fortnightly*, January 2013

"Approaches to Setting Electric Distribution Reliability Standards and Outcomes," by Serena Hesmondhalgh, William P. Zarakas, and Toby Brown, The Brattle Group, Inc., January 2012

"Measuring Concentration In Radio Spectrum License Holdings," presented at the Telecommunications Policy Research Conference (TPRC), George Mason University, September 26, 2009 (with Coleman Bazelon).

"Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets," White Paper, July 2005 (with Glenn A. Woroch, Lisa V. Wood, Daniel L. McFadden, Nauman Ilias, and Paul C. Liu).

"Betting Against The Odds? Why broadband over power lines (BPL) can't stand alone as a high-speed Internet offering." *Public Utilities Fortnightly*, April 2005, pp. 41-45 (with Kenneth J. Martinian).

"The Impact of the Number of Mobile Operators on Consumer Benefit," White Paper, March 2005 (with Kenneth J. Martinian and Carlos Lapuerta).

"Wholesale Pricing and Local Exchange Competition", Info, Volume 6, Number 5, 2004, pp. 318-325 (with Lisa V. Wood and David E. M. Sappington).

"Regulatory Performance Measurement Plans and the Development of Competitive Local Exchange Telecommunications Markets", Working Paper, November 2003 (with David E. M. Sappington, Lisa V. Wood and Glenn A. Woroch).

APPENDIX B:
GATELY CV

Susan M. Gately founded SMGately Consulting, LLC (SMGC) in January of 2011. Susan is an economic and policy expert specializing in the telecom arena with more than thirty years of consulting experience. Her specific experience lies in the areas of

- Telecom industry structure;
- Regulatory regimes;
- Cost development;
- Access charges;
- Pricing and rate structure; and
- Telecom services and network management practices.

Prior to founding SMGC Susan was a partner in and the Senior Vice President at Economics and Technology, Inc. (ETI) providing advising, litigation support, expert testimony, white papers, and in-house training and education to ETI's myriad carrier, governmental agency and large business clients. Susan has provided expert testimony on a variety of telecom policy matters and participated in hundreds of FCC proceeding on access charges, universal service, separations and cost accounting, and form of regulation.

Susan has been involved in the analysis of incumbent LEC intrastate and interstate access tariffs since the inception of the tariffs in 1984. She has participated in virtually every major FCC proceeding on access charges and price caps, and is among the nation's leading experts on access charge rate structure, methodology, and policy. Access issues addressed in the hundreds of submissions made to the FCC include access service pricing and rate structures, price caps implementation, access service costs (including cost allocation of regulated and non-regulated services), and alternative forms of regulation. Susan undertook detailed analysis of the data filed in response to the FCC's first "voluntary data request" in its special access proceeding Docket 05-25 throughout 2012.

More recently, she engaged in comprehensive analysis of issues related to terminating access monopolies in the context of the FCC's proceedings on "Protecting and Promoting the Open Internet" ultimately preparing a detailed rebuttal, *Declaration in Rebuttal of Lerner / Ordover Declaration* filed in that docket to a Declaration prepared by Andres Lerner and Janusz Ordovers.

Throughout 2011 Ms. Gately was an active participant in the FCC's USF / ICC proceeding on behalf of the AdHoc Telecommunications Users Committee preparing and submitting two separate declarations and visiting the FCC on multiple occasions to discuss the results of her analyses. In particular, Ms. Gately devoted significant effort in the analysis of RLEC cost data filed as part of that proceeding and quantification of the financial impact upon RLECs of the potential combination of reduced USF payments and reduced access charge revenues.

For the last several years Ms. Gately has also been particularly active in the analysis of special access pricing, cost, and separations data. In 2010 she authored a paper entitled *Longstanding Regulatory Tools Confirm BOC Market Power: A Defense of ARMIS*. The paper detailed the workings of and interactions between Parts 36 and 69 of the FCC's rules (the results of which are codified in ARMIS for the largest of the ILECs). Susan has been involved in the analysis of incumbent LEC intrastate and interstate access tariffs since the filing of the initial access tariffs in 1983. Ms. Gately has participated in the preparation of hundreds of submissions to the FCC on issues including access service pricing and rate structures, price caps implementation, access service costs (including cost allocation of regulated and non-regulated services), and alternative forms of regulation.

Ms. Gately has also devoted significant time over the last several years to researching and analyzing conditions extent in the wireline and wireless telecommunications markets in the US, the conditions that have led to the current market structures and the implications for users of those networks. In addition to the *ARMIS* paper identified above Ms. Gately's research and analysis in this area where codified in the following papers released in 2010. *Regulation, Investment and Jobs: How Regulation of Wholesale Markets Can Stimulate Private Sector Broadband Investment and Create Jobs* (With Helen E. Golding, Lee L. Selwyn and Colin B. Weir. Released in February, 2010.) *Revisiting US Broadband Policy: How Reregulation of Wholesale Services Will Encourage Investment and Stimulate Competition and Innovation in Enterprise Broadband Markets* (With Helen E. Golding, Lee L. Selwyn and Colin B. Weir. Released in February, 2010.)

Ms. Gately's most recent analysis of small independent company universal service issues in relation to the FCC's 2011 USF / ICC proceeding built upon her extensive past analysis of similar issues (as they relate to both state and interstate universal service funds). Beginning in 2003 and following on for the next several years she researched and documented systemic incentives to inefficiencies inherent in the FCC's USF funding mechanism. The primary documentation of that early work was a paper entitled *Lost in Translation: How Rate of Return Regulation Transformed the Universal Service Fund for Consumers into Corporate Welfare for the RLECs*, (with Scott C. Lundquist) prepared on behalf of Western Wireless, February 2004.

That work was followed later that same year with *Striking a Nerve: ETI's Rejoinder to the NTCA/OPASTCO False Premises Report*, (with Lee L. Selwyn and Scott C. Lundquist) also prepared on behalf of Western Wireless, October 2004. Ms. Gately has prepared presentations on this issue for use at en banc panels of the Federal State Board on Universal Service and presented a session at NASUCA's 2005 annual conference as well.

Among other issues addressed at the FCC has been the appropriate rate structure for the collection of universal service costs from end users, and rules related to the level of universal service funding that should be available to rural telecommunications service providers. Ms. Gately was also actively involved in the investigation of the level of cost to be recovered from the implementation of local number portability (LNP) and the appropriate method of recovering those costs. Ms. Gately was also involved in modeling and analysis of the FCC's last major revision to its access charge and price caps plan — the so called "CALLS" plan.

Ms. Gately has also been extensively involved in the analysis of cost and operational data submitted by telephone companies in the context of regulatory proceedings and audits, including the submission of expert testimony in state public utility proceedings. Her responsibilities have involved the analysis of telephone company cost data and cost study methodologies. Ms. Gately's work has included the development of alternative cost figures for the purpose of presenting alternative rate proposals. She has participated in the preparation of expert testimony on local calling area expansion, affiliate transactions, survey and statistical methodologies, cost study methodologies, revenue requirement, infrastructure and modernization, new service pricing, access pricing, unbundled network element pricing, avoided retail costs for use in setting wholesale prices and other issues related to the opening and operation of markets.

Throughout 1994, acting as a staff expert for the Delaware PSC Staff, Ms. Gately participated actively in the litigation of rules implementing an alternative regulatory plan put in place by the Delaware state legislature. Ms. Gately was one of the designated staff negotiators during an attempted negotiated settlement of the rules using Alternate Dispute Resolution (ADR) techniques. Subjects addressed by the PSC's Rulemaking included, among other things, the development of both incremental and fully distributed costing methodologies to be used by Bell Atlantic for use as incremental cost floors, and to ensure against cross-subsidization. She co-authored comments on behalf of staff regarding cost methodology, rate imputation, and unbundling requirements.

Ms. Gately was particularly active in the examination of ILEC cost data and deployment plans for basic rate interface (BRI) ISDN service. Ms. Gately was involved in all facets of a New

England Telephone BRI ISDN investigation that culminated in an affordable, widely deployed ISDN offering in Massachusetts. She has also prepared and/or sponsored testimony and comments relative to the deployment and pricing of ISDN services in Colorado, Tennessee, Texas, Ohio, and Connecticut. Ms. Gately also co-authored two separate ISDN position papers in conjunction with Dr. Lee L. Selwyn; *A Migration Plan for Residential ISDN* for the Electronic Frontier Foundation and *The Prodigy ISDN White Paper: ISDN Has Come of Age* for Prodigy Services Company.

Ms. Gately was also heavily involved in the development of avoided cost estimates for use in setting wholesale prices in a resale environment. Ms. Gately co-authored (with Dr. Lee L. Selwyn) *Commercially Feasible Resale of Local Telecommunications Services: An Essential Step in the Transition to Effective Local Competition*. She has participated in resale proceedings and or interconnection arbitrations (relative to wholesale pricing) in California, Hawaii, Illinois, Ohio, Puerto Rico, Nevada, and Louisiana.

Ms. Gately was also involved in the analysis of issues related to the application of several of the Bell Companies for Section 271 authority to enter the interLATA long distance market. Ms. Gately has also undertaken a detailed analysis of the Continuing Property Record (CPR) audits conducted by the Accounting and Audits Division of the FCC. That analysis culminated in the preparation of a paper (written in conjunction with Dr. Lee L. Selwyn) *Inflated BOC Prices: An Agenda for State PUC Actions Arising from the FCC CPR Audits.*

Ms. Gately has assisted numerous Fortune 100 companies in the evaluation of pricing, terms and conditions as part of the long distance and local procurement process.

In addition to her regulatory work, Ms. Gately has been a frequent speaker at various industry gatherings including large conventions and more specialized seminars and conferences. The subject matters have included the following wide range of issues:

- Negotiation of custom network contracts;
- ILEC central office collocation;
- The FCC's price cap plan for ILECs;
- Principles for pricing ISDN basic rate service.
- USF Funding for wireless CETCs
- Reformation of the USF High Cost Fund

Prior to joining ETI, Ms. Gately was employed as an Economic Analyst at Systems Architects, Inc. Her work there primarily involved the analysis of economic data and survey results for the Health Care Finance Administration, the Social Security Administration, and the Department of Defense.

Susan has a Bachelor of Arts degree in Economics from Smith College (1980).

Appearances in Regulatory Proceedings

Telecommunications Regulatory Board of Puerto Rico, *Telefónica Larga Distancia de Puerto Rico, Inc., Petition for arbitration pursuant to Section 47 U.S.C. 252 (b) of the Federal Communications Act and Section 5 (b), Chapter III, of the Puerto Rico Telecommunications Act, regarding interconnection rates, terms and conditions with Puerto Rico Telephone Company, Inc.*, Docket No. JRT-2006-AR-0001, on behalf of Telefónica Larga Distancia de Puerto Rico, Inc., Direct Testimony filed January 16, 2007, Reply Testimony filed February 7, 2007, cross-examination February 14, 2007, Declaration filed March 30, 2007.

United States District Court, District of New Jersey, in *Re: AT&T Corp. v. JM Telecom, LLC*, Civil Action No. 99-2578, on behalf of AT&T Corp., Expert Report filed December 5, 2003.

California Public Utilities Commission, in *Re: Order Instituting Rulemaking to Review Policies Concerning Intrastate Carrier Access Charges*, Docket No. R.03-08-018, on behalf of AT&T Communications of California, Inc. Declaration filed November 12, 2003.

Colorado Public Utilities Commission, in *Re: Application of US West Communications, Inc. for Investigation into Switched Access Rates,* Docket No. 00A-201T, on behalf of AT&T Communications of the Mountain States, Inc., Testimony of Lee L. Selwyn, filed July 18, 2000, adopted by Susan M. Gately, cross-examined on October 17, 18, 2000.

Arizona Corporation Commission, in *Re: In the Matter of the Application of US West Communications, Inc., a Colorado Corporation, for a Hearing to Determine the Earnings of the Company, the Fair Value of the Company for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon and to Approve Rate Schedules Designed to Develop Such Return*, Docket No. T-1051B-99-105, on behalf of AT&T Communications of the Mountain States, Direct Testimony filed August 9, 2000, Supplemental Direct Testimony filed November 13, 2000.

United States District Court, District of Massachusetts, in *Re: Telephone Management Corporation, Plaintiff, v. State Street Bank and Trust Company, Defendant*, Civil Action No. 97-10993 PBS, on behalf of State Street Bank and Trust Company, Expert Report filed July 17, 1998.

Delaware Public Service Commission, in *Re: In the Matter of Development of Regulations for the Implementation of Telecommunications Technology Investment Act*, Docket No. PSC Reg. 41, on behalf of Delaware Public Service Commission Staff, cross-examination March 2, 1995.

New York Public Service Commission, in *Re: Proceeding on Motion of the Commission to Investigate Performance-Based Incentive Regulatory Plans for New York Telephone Company*, Docket No. 92-C-0665, on behalf of Cable Television Association of New York, Supplemental Testimony filed September 8, 1994.

California State Legislature, in *Re: California Long Distance Telecommunications Consumer Choice Act*, Assembly Bill 3720, on behalf of AT&T, Statement before the California State Legislature, April 11, 1994.

Tennessee Public Service Commission, in *Re: In the Matter of the Commission's Investigation of Integrated Services Digital Network (ISDN)*, on behalf of Prodigy Services Company, oral testimony, November 11, 1992.

Arizona Corporation Commission, in *Re: In the Matter of the Commission's Examination of the Rates and Charges of the Mountain States Telephone and Telegraph Company*, Docket No. E-1051-88-306, on behalf of Residential Utility Consumer Office, Direct Testimony filed July 13, 1990, Rebuttal Testimony August 7, 1990.

Papers and Reports

Declaration in Rebuttal of Lerner / Ordover Declaration. Prepared on behalf of the AdHoc Telecommunications Committee and filed on Feb 19, 2015 in FCC Docket GN 14-58, *Protecting and Promoting the Open Internet*.

The Benefits of a Competitive Business Broadband Market (With Helen E. Golding) prepared on behalf of the Competitive Broadband Coalition, March 2013.

Regulation, Investment and Jobs: How Regulation of Wholesale Markets Can Stimulate Private Sector Broadband Investment and Create Jobs (With Helen E. Golding, Lee L. Selwyn and Colin B. Weir. Released in February, 2010.)

Revisiting US Broadband Policy: How Reregulation of Wholesale Services Will Encourage Investment and Stimulate Competition and Innovation in Enterprise Broadband Markets- (With Helen E. Golding, Lee L. Selwyn and Colin B. Weir. Released in February, 2010.)

Longstanding Regulatory Tools Confirm BOC Market Power: A Defense of ARMIS (With Helen E. Golding, Lee L. Selwyn and Colin B. Weir. Released in January, 2010.)

The Role of Regulation in a Competitive Telecom Environment: How Smart Regulation of Essential Wholesale Facilities Stimulates Investment and Promotes Competition (With Helen E. Golding, Lee L. Selwyn, and Colin B. Weir. Released in March, 2009.)

Special Access Overpricing and the US Economy: How Unchecked RBOC Market Power is Costing US Jobs and Impairing US Competitiveness (with Helen E. Golding, Lee L. Selwyn, and Colin B. Weir), prepared on behalf of the AdHoc Telecommunications Users Committee, August 2007.

HOLD THE PHONE: Debunking the Myth of Intermodal Alternatives for Business Telecom Users in New York, prepared on behalf of the UNE-L CLEC Coalition in New York, August 2005.

*The 2005 Update of the 1999 TFP Model Calculating a Productivity Factor for Interstate Special Access***,** prepared on behalf of the Ad Hoc Telecommunications Users Committee**,** submitted as an attachment to Susan M. Gately's Reply Declaration, filed in FCC WC Docket No. 05-25, *Special Access Rates for Price Cap Local Exchange Carriers*, July 29, 2005.

Striking a Nerve: ETI's Rejoinder to the NTCA/OPASTCO False Premises Report, (with Lee L. Selwyn and Scott C. Lundquist) prepared on behalf of Western Wireless, October 2004.

Competition in Access Markets: Reality or Illusion, A Proposal for Regulating Uncertain Markets, (with Lee L. Selwyn and Helen E. Golding), prepared on behalf of the Ad Hoc Telecommunications Users Committee, August 2004.

Lost in Translation: How Rate of Return Regulation Transformed the Universal Service Fund for Consumers into Corporate Welfare for the RLECs, (with Scott C. Lundquist) prepared on behalf of Western Wireless, February 2004.

Business Telecom Users Benefit from UNE-P Based Competition, (with Lee L. Selwyn) prepared on behalf of AT&T, January 2003.

Inflated BOC Prices: An Agenda for State PUC Action Arising from the FCC CPR Audits, (with Lee L. Selwyn) prepared on behalf of AT&T, July 2000.

The "Connecticut Experience" with Telecommunications Competition: A Case Study in Getting it Wrong, (with Lee L. Selwyn and Helen E. Golding) prepared on behalf of AT&T, February 1998.

Commercially Feasible Resale of Local Telecommunications Services: An Essential Step in the Transition to Effective Local Competition, (with Lee L. Selwyn) prepared on behalf of AT&T, July 1995.

The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers, prepared by Economics and Technology, Inc. (with Lee L. Selwyn) and Hatfield Associates, Inc., on behalf of AT&T, MCI Communications Corporation, Competitive Telecommunications Association, February 1994.

LEC Price Cap Regulation: Fixing the Problems and Fulfilling the Promise , (with Lee L. Selwyn, David J. Roddy, Sonia N. Jorge and Scott C. Lundquist), prepared on behalf of the Ad Hoc Telecommunications Users Committee, May 1994.

Access and Competition: the Vital Link, (with Lee L. Selwyn), prepared on behalf of the Ad Hoc Telecommunications Users Committee, April 1994.

Pricing and Policy Issues Affecting Local/Access Service in the U.S. Telecommunications Industry, (with Lee L. Selwyn, W. Page Montgomery, and Jenny H. Yan), prepared on behalf of the Canadian Radio-Television and Telecommunications Commission, December

1992.

ISDN Has Come of Age, (with Lee L. Selwyn), prepared on behalf of Prodigy Services Company, November 1992.

A Roadmap to the Information Age: Defining a Rational Telecommunications Plan for Connecticut, (with Lee L. Selwyn, Susan M. Baldwin, JoAnn S. Hanson, David N. Townsend and Scott C. Lundquist), prepared on behalf of the Connecticut Office of Consumer Counsel, October 30, 1992.

Migration Plan for Residential ISDN Deployment, (with Lee L. Selwyn) prepared on behalf of the Communications Policy Forum, Electronic Frontier Foundation, and April 20, 1992.

Efficient Pricing for ONA Access : Recommendations for Modifications to Part 69 of the FCC's Rules to Accommodate an Open Network Architecture, (with Lee L. Selwyn, JoAnn S. Hanson, and David N. Townsend), prepared on behalf of the Coalition of Open Network Architecture Parties, The ONA Users Group, and Ad Hoc Telecommunications Users Committee, August 10, 1989.

Use of Featured Group Carrier Switched Access Services for National Paging Access: An Examination of Potential Feasibility, (with Lee L. Selwyn) prepared on behalf of National Satellite Paging, Inc., March 15, 1989.

APPENDIX C:
TABLES

Table 1
Derivation of Share Analysis Data Sets

Step	Circuit Counts			Revenues			Location Counts		
	ILEC	CLEC	Total	ILEC	CLEC	Total	Filer-Locations	Census Blocks	Building/Cell Towers
[redacted]									

Sources and Notes:

[redacted]

Table 2
Count of Circuits by Bandwidth Bucket

	Bandwidth Bucket (Mbps)					
Filer	0-10	10-50	50-200	200-800	800+	Total
Verizon	[redacted]					
AT&T						
CenturyLink						
Frontier						
Windstream						
Other ILECs						
Total ILECs						
% Total						
CLECs						
% Total						
Total						
% Grand Total						

Sources and Notes:

[redacted]

Table 3
Revenue-Based Market Share Analysis
Facilities-Based Special Access - By Service Bandwidth

Panel 3A: (0 – 10 Mbps)

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]					
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Panel 3B: (10 – 50 Mbps)

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]					
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Panel 3C: (50 – 200 Mbps)

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]					
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Table 3 (cont'd)
Revenue Based Market Share Analysis
Owned Special Access - By Service Bandwidth

Panel 3D: (200 – 800 Mbps)

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]	[redacted]				
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Panel 3E: (800+ Mbps)

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]	[redacted]				
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Panel 3F: Total

ILEC Service Area		ILEC Revenues	CLEC Revenues	Total Revenues	ILEC Market Share	CLEC Market Share
Verizon	[1]	[redacted]				
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Missing Footprint	[7]					
Total	[8]					

Sources and Notes:

[redacted]

Table 4
Facilities-Based Special Access
Provider Presence - By Census Block

Panel 4A: Breakdown of All Census Blocks with Special Access Service

ILEC Service Area		Census Blocks Where Special Access Sales Are Reported: Total [a]	ILECs [b]	CLECs [c]	ILECs + CLECs [d]	ILECs + CLECs (%) [e] = [d]/[a]	Only ILECs [f]	Only ILECs (%) [g] = [f]/[a]
Verizon	[1]	[redacted]						
AT&T	[2]							
CenturyLink	[3]							
Frontier	[4]							
Windstream	[5]							
Total ILECs (Including Other ILECs)	[6]							

Panel 4B: Breakdown of Census Blocks With ILEC and CLEC Presence

ILEC Service Area		Census Blocks Served By ILECs + CLECs [a]	Number of CLECs Providing Special Access: 1 [b]	1 [c] = [b]/[a]	2 [d]	2 [e] = [d]/[a]	3+ [f]	3+ [g] = [f]/[a]
Verizon	[1]	[redacted]						
AT&T	[2]							
CenturyLink	[3]							
Frontier	[4]							
Windstream	[5]							
Total ILECs (Including Other ILECs)	[6]							

Sources and Notes

[redacted]

Table 5
Facilities-Based Special Access
Distribution of Provider Presence – By Location (Building/Cell Tower)

Panel 5A: Frequency

ILEC Service Area		Total Number of Buildings Or Cell Towers	Number CLEC Providers In Building / Tower 0	1	2	3+
Verizon	[1]	[redacted]				
AT&T	[2]					
CenturyLink	[3]					
Frontier	[4]					
Windstream	[5]					
Other ILECs	[6]					
Total ILECs	[7]					
CLECs (Missing Footprint)	[8]					
Total	[9]					

Panel 5B: Percentage Breakdown

ILEC Service Area		Number CLEC Providers In Building / Tower 0	1	2	3+
Verizon	[1]	[redacted]			
AT&T	[2]				
CenturyLink	[3]				
Frontier	[4]				
Windstream	[5]				
Other ILECs	[6]				
Total ILECs	[7]				
CLECs (Missing Footprint)	[8]				
Total	[9]				

Sources and Notes

[redacted]

Table 6
Bandwidth-Based Share Analysis
Facilities-Based Special Access

ILEC Service Area		Total Census Blocks: Carrier Census Blocks [a]	Census Blocks (Sole Provider): Carrier Census Blocks [b]	% Carrier Census Blocks [c]=[b]/[a]	% Total Census Blocks [d]=[b]/[8][a]
Verizon	[1]	[redacted]			
AT&T	[2]				
CenturyLink	[3]				
Frontier	[4]				
Windstream	[5]				
Total ILECs (incl. Other ILECs)	[6]				
Total CLECs	[7]				
Total	[8]				

Sources and Notes:

[redacted]

Table 7
Bandwidth-Based Share Analysis
Distribution of HHIs By Census Block

Panel 7A: (Census Blocks Where ILECs Provide Special Access)

	HHI Scores	
HHI Range	Number of Census Blocks	Percentage
0 - 1,500	[redacted]	
1,501 - 2,500		
2,501 - 5,000		
5,001 - 7,500		
7,501 - 9,999		
9,999 - 10,000		
Total		

Panel 7B: (All Census Blocks Where Special Access is Provided)

	HHI Scores	
HHI Range	Number of Census Blocks	Percentage
0 - 1,500	[redacted]	
1,501 - 2,500		
2,501 - 5,000		
5,001 - 7,500		
7,501 - 9,999		
9,999 - 10,000		
Total		

Sources and Notes:

[redacted]

Table 8
Comparison CLEC Fiber Presence By Census Block and
Census Blocks In Which CLECs Provide Facilities-Based Special Access

[redacted]

Sources and Notes:

[redacted]

VERIFICATIONS

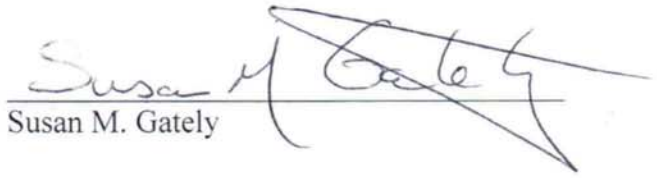
I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on January 21, 2016

William P. Zarakas

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on January _21_, 2016



Susan M. Gately